

**WHAT IS CLAIMED IS:**

1. In a process for preparing oligomeric aliphatic diols, the improvement comprising including a phase separation step in the work up of the reaction  
5 mixture to give an organic and an aqueous phase.
2. A process for preparing oligomeric aliphatic diols comprising:  
oligomerizing an aliphatic diol in the presence of an acid catalyst and an  
entraining agent, wherein the water formed is distilled off  
10 azeotropically,  
adding an aqueous base to the reaction mixture after reaching the desired  
degree of oligomerization and hydrolyzing any esters formed  
during oligomerization,  
adjusting the pH of the reaction mixture of 4.0 to 8.0 by adding non-  
15 oxidizing inorganic acids or the salts thereof, and,  
isolating, dewatering and filtering the organic phase after phase separation  
of the reaction mixture.
3. A process for preparing polycarbonatediols comprising reacting an  
20 oligomeric aliphatic diol prepared according to Claim 1 with a sub-stoichiometric  
amount of a carbonate donor in the presence of a catalyst.
4. The process according to Claim 3, wherein the catalyst comprises a basic  
magnesium salt.  
25
5. The process according to Claim 3 wherein the carbonate donor comprises  
diphenyl carbonate.
6. A process for preparing NCO-terminated prepolymers comprising reacting  
30 sub-stoichiometric amounts of the polycarbonatediol made according to Claim 4  
with a polyisocyanate.

7. The process according to Claim 6, wherein the polyisocyanate comprises diphenylmethane diisocyanate.
8. In a process of preparing polyurethane, the improvement comprising  
5 incorporating at least one oligomeric aliphatic diol made according to Claim 1.
9. In a process of preparing polyurethane, the improvement comprising incorporating at least one oligomeric aliphatic diol made according to Claim 2.
- 10 10. In a process of preparing polyurethane, the improvement comprising incorporating at least one NCO-terminated prepolymer made according to Claim 6.